

**Appendix H**  
**Chemical Engineering Design Criteria**



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## Appendix H - Chemical Engineering Design Criteria

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## **H.1 INTRODUCTION**

This appendix summarizes the codes, standards, criteria, and practices that will be generally used in the design and installation of chemical engineering systems for the Watson Cogeneration Steam and Electric Reliability Project (Project). More specific Project information will be developed prior to construction of the Project to support detailed design, engineering, and material procurement and construction specifications, as required by the California Energy Commission (CEC).

## **H.2 CODES AND STANDARDS**

The design of the chemical systems and components will be in accordance with the laws and regulations of the federal government, the State of California, and Los Angeles County, and local ordinances and industry standards. The most current issue or revision of rules, regulations, codes, ordinances, and standards at the time of filing this Application for Certification (AFC) will apply, unless otherwise noted. If there are conflicts between cited documents, the more conservative requirements will apply.

The following codes and standards are applicable to the chemical aspects of the facility:

- American Society of Mechanical Engineers (ASME)
  - ASME B31.1            Power Piping Code
  - ASME B31.3            Process Piping Code
- ASTM International (ASTM)
  - ASTM D859-05        Standard Test Method for Silica in Water
  - ASTM D888-05        Standard Test Method for Dissolved Oxygen
  - ASTM D513-06        Standard Test Methods for Total and Dissolved Carbon Dioxide in Water
- Occupational Safety and Health Administration (OSHA)
- Underwriters Laboratories (UL)
- American Waterworks Association (AWWA)
  - AWWA 2540-Method C for total dissolved solids (TDS)
  - AWWA 2540-Method D for total suspended solids (TSS).

Other recognized standards will be used as required to serve as design, fabrication, and construction guidelines when not in conflict with the above listed standards.

The codes and industry standards used for design, fabrication, and construction will be the codes and industry standards, including all addenda, in effect as stated in equipment and construction purchase or contract documents.

### **H.3 GENERAL CRITERIA**

#### **H.3.1 Water Sources**

Water will come from the BP Refinery's existing distribution system. Reclaimed water will supply the existing deaerator feed as part of an ongoing reclaimed water project. Sanitary and service water will be supplied from the refinery's water connection.

##### ***H.3.1.1 Circulating Water***

Circulating cooling water will come from the existing cooling water system. Makeup water is supplied from the reclaimed water connection. Water is blown down to help maintain proper water chemistry. Chemical feed systems will supply water-conditioning chemicals that control pH and minimize corrosion, scaling, and biological growth.

##### ***H.3.1.2 Combustion Turbine Inlet Evaporative Cooling Water***

Demineralized water (Second Pass Reverse Osmosis Water) to the combustion turbine (CT) inlet foggers will be supplied from the existing refinery's water connector.

##### ***H.3.1.3 Service Water and Sanitary Use Water***

Sanitary water from the Watson Cogeneration Facility will be used as sanitary water for stations around the Project (e.g., safety showers and eye wash stations). Drain discharge will flow to the existing oily water sewer system.

##### ***H.3.1.4 Construction Water***

Water supply for the construction of the Project will be provided by existing water systems at the BP Refinery. During construction the small quantity of potable water (domestic consumption by the Project's construction workforce) will be provided from a bottled water purveyor.

##### ***H.3.1.5 Fire Protection Water***

Water for fire protection is supplied through a connection to the Watson Cogeneration fire water system.

#### **H.3.2 Chemical Storage**

##### ***H.3.2.1 Storage Capacity***

Chemical storage tanks, if required, will, in general, be sized to store a minimum of 1.5 times the normal bulk shipment. Anhydrous ammonia storage for the selective catalytic reduction (SCR) is located at the Watson Cogeneration Facility. No additional storage capacity is required for the Project.

#### ***H.3.2.2    Containment***

Chemical storage tanks containing corrosive or hazardous fluids that will be stored within the Project Site will be surrounded by curbing. Curbing and drain piping will be designed to contain a spill of 110 percent of the full tank capacity without overflowing the curbing. For multiple tanks in a single area, the largest tank will be used to size the curbing.

#### ***H.3.2.3    Coatings***

Tanks, piping, and curbing for chemical storage application will be provided with appropriate protective coatings.

#### **H.3.3       Wastewater Disposal**

Wastewater will be routed to the existing oily water sewer system.

